

DRAFT

BEFORE THE  
PUBLIC UTILITIES COMMISSION OF THE STATE OF CALIFORNIA

**FILED**

Rulemaking on the Commission's  
Own Motion to Govern Open Access  
to Bottleneck Services and  
Establish a Framework of Network  
Architecture Development of  
Dominant Carrier Networks.

) PUBLIC UTILITIES COMMISSION

) AUG 23 1995

) SAN FRANCISCO OFFICE

) NR-93-04-003

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Investigation on the Commission's  
Own Motion into Open Access and  
Network Architecture Development  
of Dominant Carrier Networks.

) I.93-04-002

CONSENSUS COSTING PRINCIPLES/BASIC NETWORK FUNCTIONS;  
OANAD COST METHODOLOGY WORKSHOPS

CALIFORNIA TELECOMMUNICATIONS COALITION

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August 23, 1995

## CONSENSUS COSTING PRINCIPLES

The parties participating in the OAND cost study workshops have reached agreement that the following nine costing principles, with associated explanatory text, should replace the principles and text that appear in Attachment A of the Assigned Commissioner's Ruling.

**Principle No. 1: Long run implies a period long enough that all costs are avoidable.**

Long run is a period of time long enough so that all costs are treated as avoidable. Variable is synonymous with volume-sensitive and therefore not synonymous with avoidable. Avoidable costs can include both volume-sensitive and volume-insensitive costs. The purpose of this principle is to preclude the possibility of cross-subsidization by ensuring that TSLRIC estimates include all costs necessary to provision a telecommunications service.

**Principle No. 2: Cost causation is a key concept in incremental costing.**

Cost causation is a consistent and fundamental principle of TSLRIC studies. The principle of cost causation should be utilized to determine the appropriateness of including a cost in a TSLRIC study. The basic principle of cost causation is that only those costs that are caused by a cost object in the long run should be directly attributable to that cost object. Costs are considered to be caused by a cost object if the costs are brought into existence as a direct result of the cost object or, in the long run, can be avoided when the company ceases to provide the cost object.

For example, within the telecommunications industry, the principle of cost causation is best viewed from the standpoint of providing a service and what costs are necessary to offer that service. All costs caused by a decision to offer a service should be included in a TSLRIC study of that service.

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**Principle No. 3: The increment being studied shall be the entire quantity of the service provided, not some small increase in demand.**

1. TSLRIC studies for "disaggregated pieces"<sup>1</sup> of the LECs' networks shall form the basis of TSLRIC studies for LEC "services"<sup>2</sup> so that the results of the cost studies for "disaggregated pieces" will be blind to the "services" that use those pieces.
2. The TSLRIC study for each "disaggregated piece" shall use an increment of demand equal to the aggregate demand for that "disaggregated piece" across all its uses as an input to LEC "services" and, if applicable, as a separately tariffed LEC "service." The TSLRIC study for each "disaggregated piece" shall separately identify the volume-insensitive and volume-sensitive costs for that "disaggregated piece," taking into account the entire aggregated demand for the "disaggregated piece."
3. The TSLRIC study for each LEC "service" shall include the volume-sensitive costs of shared "disaggregated pieces" and the total costs (both volume-sensitive and volume-insensitive) for all "disaggregated pieces" or functions that are dedicated uniquely to the LEC "service" being studied.

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<sup>1</sup> For purposes of this consensus item, the term "disaggregated piece" has been used in place of the terms "resource," "basic network function" and "basic network component/basic network element" that were used in individual parties' filings. Although not precisely defined here, "disaggregated piece" refers to a higher level of aggregation than "nuts and bolts" items such as line cards, but (typically) a lower level of aggregation than tariffed LEC services. Some "disaggregated pieces" may, however, be offered as separately tariffed services in addition to being used as inputs to bundled LEC services.

<sup>2</sup> The term "services" refers to separately tariffed LEC service offerings or contracts, which may bundle together "disaggregated pieces" or may offer a single "disaggregated piece" for public purchase.

Consensus Costing Principles  
R.93-04-003, I.93-04-002

4. The TSLRIC study for each individual LEC "service" shall not include volume-insensitive costs of shared "disaggregated pieces." Instead, the TSLRIC for the group of services that share "disaggregated pieces" shall include the volume-insensitive cost of the shared "disaggregated pieces" plus all relevant volume-sensitive costs.
5. The total increment of demand at the "disaggregated piece" level is used to determine the size and the characteristics of the technology that shall be used to determine the TSLRIC.

The parties agree that this costing principle would produce costs that are relevant for determining whether cross-subsidization exists. All parties reserve the right to produce or request additional cost studies for other purposes and to identify other purposes for TSLRIC cost studies.

**Principle No. 4: Any function necessary to produce a service must have an associated cost.**

This principle assumes that any function necessary to produce an output or telecommunication service has an associated cost — whether that cost is volume-sensitive or volume-insensitive. The associated cost necessary to offer a service should in turn be included in a TSLRIC analysis. There shall be a presumption that no costs are sunk unless demonstrated to the contrary. The party seeking to demonstrate sunk costs has the burden of proof.

**Principle No. 5: Common costs, if any, are not part of a TSLRIC study, except for a TSLRIC study of the firm as a whole.**

TSLRIC studies shall include costs that are often called overhead costs if those costs are caused by the decision to offer the cost object. TSLRIC studies of individual services shall exclude overheads that are not demonstrated to be caused by the cost object. Recognition of such costs will be treated as a pricing issue. No cost shall be assumed to be volume-insensitive common cost on the basis of its accounting treatment.

**Principle No. 6: Technology used in a long run incremental cost study shall be the least-cost, most efficient technology that is currently available for purchase.**

This principle assumes that a TSLRIC analysis should be based on the existing or planned location of switching and outside plant facilities using the least-cost, most efficient technology. The least-cost technology should reflect a known and proven technology that is clearly identified and is in use, at least partially today.

**Principle No. 7: Costs shall be forward looking.**

TSLRIC studies shall be "forward looking", i.e., they shall not reflect a company's embedded base of facilities. Rather the study shall account for only the most efficient and cost-effective means of providing the service. Efficiency requires that future costs be taken into account. Future costs must include all cost components required to provision a telecommunications service.

**Principle No. 8: Cost studies shall be performed for the total output of specific services and will use as a basis the basic network functions which comprise the services plus all other service specific costs.**

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The cost methodology implementation should ensure that costs for services which use the network in the same way are treated consistently in terms of the network functions contributing to their respective costs. Specifically, the parameters of volume, distance and duration, and time of day, as to their effect on cost, should be consistently applied from service to service to the extent that the services use the network in the same way and to the same extent. For example, peak/off-peak cost differences shall be based on the aggregated usage patterns of all directly substitutable services within a given market.

**Principle No. 9:** The same long run incremental cost methodology shall apply to all services, new and existing, regulated and non-regulated, competitive and non-competitive.

A TSLRIC study shall be based on a specific set of costing principles and data that yields consistent cost results that can be compared to all services, new and existing, regulated and non-regulated, competitive and non-competitive.

### Types of Costs

Throughout this discussion, various costing terms have been used. These terms — such as "direct," "indirect," "common" and "joint" — have been taken from the two-volume cost study report submitted to the Oregon Public Utility Commission (PUC) in Docket UM-351 (1993). This report identified the following types of costs associated with basic network functions:

**Volume-sensitive costs** — Costs that vary with changes in the output measured according to the cost drivers established for the output. (It is important to note that the term volume-sensitive is not synonymous with the terms usage-sensitive or traffic-sensitive.)

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**Volume-insensitive costs** — Costs that do not vary with changes in the quantity of output, but are avoidable by not supplying the output.

**Shared costs** — Costs that are attributable to a group of outputs but not specific to any one within the group which are avoidable only if all outputs within the group are not provided.

**Service-specific costs** — Costs, other than basic network function specific costs, that are caused by offering a service (e.g., service advertising).

**Common costs** — Costs that are common to all outputs offered by the firm. While these costs are not considered part of a TSLRIC study, recovery of such costs is required.

Recovery of common costs is a pricing issue.

#### **Inclusion of Annual Charge Factors**

In Docket UM-251, the Oregon PUC adopted the use of factors and loadings as one of its main costing principles. Factors and loading are used when costs cannot be identified directly. Examples are operations and maintenance, depreciation, taxes and rate of return. These factors and loadings are an appropriate part of a TSLRIC study.

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**BNF Costs vs. Service-Specific Costs**

The LECs will report all investments and associated capital costs (*i.e.*, cost of money, taxes and depreciation) as BNF costs. The LECs will report cash operating expenses other than maintenance expenses as service-specific costs. The parties do not agree as to whether maintenance expenses shall be treated as costs of services or costs of BNFs.



## CONSENSUS BASIC NETWORK FUNCTIONS

The parties participating in the OAND cost study workshops have agreed that the following definitions of Basic Network Functions ("BNFs") and specifications of cost drivers for each BNF should replace the discussions of the corresponding categories of BNFs and associated cost drivers that appeared in Attachment B of the Assigned Commissioner's Ruling. Those BNFs that are not specifically addressed in this "Consensus Basic Network Functions" document are not the subject of agreement among the parties.

### NETWORK ACCESS CHANNEL

#### General Category

**BNFs for subcategory Network Access Channel.**

**Pacific Bell<sup>3</sup>**

#### **Feeder**

A cost function formula for feeder facilities for each wire center showing cost varying as a function of distance from the wire center.

#### **Distribution**

A cost function formula for distribution facilities for each wire center showing cost varying as a function of distance from the serving area interface (SAI).

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<sup>3</sup> Cost equals unit investment cost.

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**Electronics**                      The service-specific electronic facilities necessary to utilize feeder and distribution for that service.

**Fiber Ring**                      A per access line unit cost.

**Service Map**                      A map or description of how much fiber ring or feeder and distribution facilities and which service-specific service electronics are necessary to establish network access for each service. The "map" will also include the customer density distribution, by service, for each of the areas for which the facilities information is provided.

GTE

**Copper Technology<sup>4</sup>**              Cost detail will be provided by density category (e.g., high, medium and low) and by distance for basic level network access channels (i.e., loops). Copper technology will be used for shorter loops (e.g., up to 12 kilofeet).

**Pair-Gain Technology<sup>4</sup>**              Cost detail will be provided by density category (e.g., high, medium and low) and by distance for basic level network access channels (i.e., loops). Pair-gain technology (i.e., fiber cable leaving the central office, a pair-gain device and copper cable) will be used for longer loops. The cost will be

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<sup>4</sup> Unit (or monthly) cost detail, by density category, by distance, and by bandwidth, and examples will be available for mapping to final services.

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identified for copper cable, fiber cable, support structures (*i.e.*, poles and conduit systems common to both), and pair-gain devices (*i.e.*, electronics).

**Fiber Technology<sup>4</sup>**

Cost detail will be provided by system size for DS-1 and DS-3 network access channels. Costs will be identified for fiber cable, support structures and associated electronics.

**Channel Performance,  
Other Features and  
Functions (CP)**

This category of cost will address equipment components (*e.g.*, electronics) which are used in conjunction with the basic network access channel to meet the quality or utility of specific services (*e.g.*, private line).

Cost Drivers: distance from the wire center (or central office); electronics; fiber ring length; size of cable/system; bandwidth wire center size/density. Pacific's studies may not show facilities' costs varying as a function of density within a wire center, reflecting unit investments per wire center.

**BNFs for subcategory NA Channel Connection.** The subcategory of BNFs that provide the interface between the NA Channel, the switched network, another NA Channel or a Dedicated Transport interoffice transmission path.

- (1) Network Access Channel Connection - Switch Interface<sup>5</sup>
- (2) Network Access Channel Connection - Cross-connect (*i.e.*, the jumper)  
  
E.g.:
  - Analog
  - DS-0
  - DS-1
  - DS-3
- (3) EISCC (*i.e.*, the connection between the point of interconnection and the LEC's cross-connect point)  
  
E.g.:
  - Analog
  - DS-0
  - DS-1
  - DS-3

## SWITCHING AND SWITCHING FUNCTIONS

BNFs for subcategory Switching. The subcategory of BNFs that establish a call and a temporary transmission path through the switch architecture for originating, terminating, intraoffice (single office), interoffice (multi-office) or tandem switching. Each BNF consists of a particular call setup, by time-of-day (TOD) and duration by TOD.

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<sup>5</sup> This is also referred to as non-traffic-sensitive switching (*i.e.*, a line termination, cable to the main distribution frame, etc.).

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ISSUE: The TOD cost driver distinguishes between peak and off-peak usage. Pacific Bell defines the peak period as the busy-hour, MCI defines the peak period as the billing period in which the peak occurs (e.g., day).

**BNFs for subcategory Switching.<sup>6</sup>**

- (a) **BNFs for subcategory Intraoffice (Single-Office) Switching: Setup and Duration.**
- (b) **BNFs for subcategory Interoffice (Multi-Office) Switching - Originating Office: Setup and Duration.**
- (c) **BNFs for subcategory Interoffice (Multi-Office) Switching - Terminating Office: Setup and Duration.**
- (d) **BNFs for subcategory Tandem Switching: Setup and Duration.**

**SS7 SIGNALLING NETWORK FUNCTIONS**

**BNFs for subcategory SS7 Signalling.** The subcategory of BNFs that provide the temporary signalling transmission path through the network. The signalling network consists of the signaling links, Signal Transfer Point (STP) and Service Control Point (SCP).

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<sup>6</sup> The cost drivers are (a) for setup: office technology, on-peak/off-peak, digits dialed, forwarding of calling party identification; (b) for duration: office technology, on-peak/off-peak.

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**BNFs for subcategory SS7 Signalling**

- (1) **Setup:** Cost drivers are busy-hour octets.
- (2) **Queries:** Cost drivers are busy-hour octets.
- (3) **Links:** Cost drivers are bandwidth and distance.
- (4) **STP interface:** The bandwidth-specific standard interface to STP node. Cost drivers are number of 56kbs link terminations.

**TRANSPORT**

General Category

Subcategories within Transport

- 6) **Dedicated Transport** - A full period, bandwidth specific (DS-0, DS-1, DS-3) interoffice transmission path between switching offices and/or serving wire centers of an LEC.

**Termination** - An interface between the channel connection and the dedicated transport facilities.

**(6-1) DS-0 Level**

**(6-2) DS-1 Level**

**(6-3) DS-3 Level**

**Facility** - The full period, bandwidth specific (DS-0, DS-1, DS-3) interoffice transmission path established between two points of dedicated transport termination.

**(6-4) DS-0 Level**

**(6-5) DS-1 Level**

**(6-6) DS-3 Level**

Possible cost drivers: Bandwidth, whether office is on or off the fiber ring, nodes on the ring, number of rings (*i.e.*, for inter-ring application), system size and/or distance.

7) **Switched Transport** - The temporary time-sensitive interoffice transmission paths between switching offices and/or serving wire centers of the LEC.

**(7-1) Termination** - An interface between the switching function and switched transport facilities.

- (7-2) **Facility** - The temporary interoffice transmission path established between two points of switched transport termination
- (7-3) **Tandem Switching** - The intermediate points of switching used as an economic surrogate to direct routing of interoffice facilities in the provision of switched transport

Possible cost drivers: Calls and minutes by time of day, whether the office is on or off the fiber ring, nodes on the ring, number of rings (*i.e.*, for inter-ring application), system size and/or distance.




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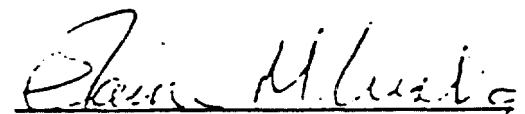
The undersigned parties hereby confirm that the Consensus Costing Principles and Consensus Basic Network Functions presented on pages 1 through 15 of this document accurately present the agreement reached in the OAND Cost Study Workshops and that they support Commission adoption of these costing principles, basic network functions and associated cost drivers for purposes of the cost studies to be produced by the Local Exchange Carriers in this docket.

Dated: August 11, 1995

  
William C. Harrelson for  
the California Telecommunications Coalition

\_\_\_\_\_  
Ira Kalinsky for  
the Division of Ratepayer Advocates

\_\_\_\_\_  
Cecil Simpson for  
DOD/FEA

  
Judith Endejan for  
GTE California, Inc.

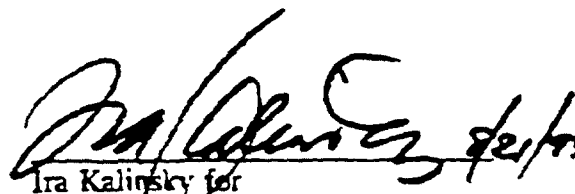
\_\_\_\_\_  
Timothy Dawson for  
Pacific Bell

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R.93-04-003, 1.93-04-002

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Dated: August 11, 1995

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William C. Harrelson for  
the California Telecommunications Coalition  
Ira Kalinsky for  
the Division of Ratepayer Advocates

---

Cecil Simpson for  
DOD/FEA

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Judith Endejan for  
GTE California, Inc.

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Timothy Dawson for  
Pacific Bell

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DOCKET

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Dated: August 11, 1995

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William C. Harréson for  
the California Telecommunications Coalition

---

Ira Kalinsky for  
the Division of Ratepayer Advocates

*Cecil O. Simpson, 8/14/95*  
Cecil Simpson for  
DOD/FEA (The U.S. Department of Defense  
and All Other Federal Executive Agencies)

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Judith Endejan for  
GTE California, Inc.

---

Timothy Dawson for  
Pacific Bell

Timothy S. Dawson  
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San Francisco, California 94105  
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**PACIFIC BELL.**  
A Pacific Telesis Company

APPENDIX C  
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August 21, 1995

Via Facsimile

Mr. William Harrelson  
MCI  
201 Spear Street  
Ninth Floor  
San Francisco, California 94105

Re: OANAD Cost Workshops  
- Consensus Document

Dear Bill:

Enclosed is the final version of the consensus document coming out of the cost workshops. This version was faxed to me by Terry Murray this afternoon. This version is acceptable to Pacific Bell.

Sincerely,



cc: Mr. Lakritz  
Ms. Murray (w/o enclosure)

DRAFT

**CERTIFICATE OF SERVICE**

I, Gina Gomez, certify that the following is true and correct:

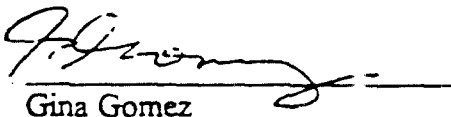
I am a citizen of the United States, State of California, am over 18 years of age, and am not a party to the within cause.

My business address is 201 Spear Street, 9th Floor, San Francisco, California, 94105.

On August 23, 1995, I served the attached **Consensus Costing Principles/Basic Network Functions; OANAD Cost Methodology Workshops** by placing true copies thereof in envelopes addressed to the parties in the attached service list.

Executed this 23rd day of August, 1995 at San Francisco, California.

**MCI TELECOMMUNICATIONS CORPORATION**  
201 Spear Street, 9th Floor  
San Francisco, CA 94105  
(415) 978-1199

  
Gina Gomez

(END OF APPENDIX C)

[REDACTED]

BEFORE THE PUBLIC UTILITIES COMMISSION OF THE STATE OF CALIFORNIA

Rulemaking on the Commission's	)	R.95-01-020
Own Motion into Universal Service	)	(Filed January 24, 1995)
and to Comply with the Mandates of	)	
Assembly Bill 3643	)	
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Investigation on the Commission's	)	I.95-01-021
Own Motion into Universal Service	)	(Filed January 24, 1995)
and to Comply with the Mandates of	)	
Assembly Bill 3643	)	
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OPENING REPORT OF  
THE DIVISION OF RATEPAYER ADVOCATES  
REGARDING THE COST PROXY MODELS AND OTHER ISSUES  
IN THE UNIVERSAL SERVICE PROCEEDING  
[Proprietary information  
designated as proprietary by a utility  
has been redacted.]

Filed: April 17, 1996

MAY 15 1996

## MEMORANDUM

This report was prepared by the Division of Ratepayer Advocates (DRA) of the California Public Utilities Commission. DRA has prepared this report as part of its ongoing participation in the Universal Service proceeding, R.95-01-020/I.95-01-021. Angela Young served as project manager for this proceeding and was responsible for the coordination of this report.

On February 21, 1996, Administrative Law Judge Wong issued a ruling listing thirteen questions as issues to be addressed in the evidentiary hearings of this proceeding. The following list identifies individual witnesses who will be sponsoring DRA's position and recommendations relating to these thirteen questions/issues.

- CHAPTER 1 - Introduction and Summary of Recommendations  
Witness: Angela Young
- CHAPTER 2 - Commission's Expectation of a Proxy Cost Model  
Witness: Hassan Mirza
- CHAPTER 3 - DRA's Position and Recommendations on the Proxy Cost Model
  - I. [Q.1] Witness: Hassan Mirza
  - II. [Q.2] Hassan Mirza
  - III. [Q.3] Hassan Mirza  
Angela Young
  - IV. [Q.6] Hassan Mirza
  - V. [Q.4] Angela Young
  - VI. [Q.8] Angela Young
  - VII. [Q.9] Angela Young
  - VIII. [Q.5] Angela Young
  - IX. [Q.7] Angela Young
  - X. [Q.10] Zenaida Conway
- Chapter 4 - DRA's Recommendation on Other Universal Service Issues
  - I. [Q.1] Witness: Truman Burns
  - II. [Q.2] Truman Burns
  - III. [Q.3] Truman Burns

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	Zenaida Conway	ZTC-1
	Truman L. Burns	TXB-1